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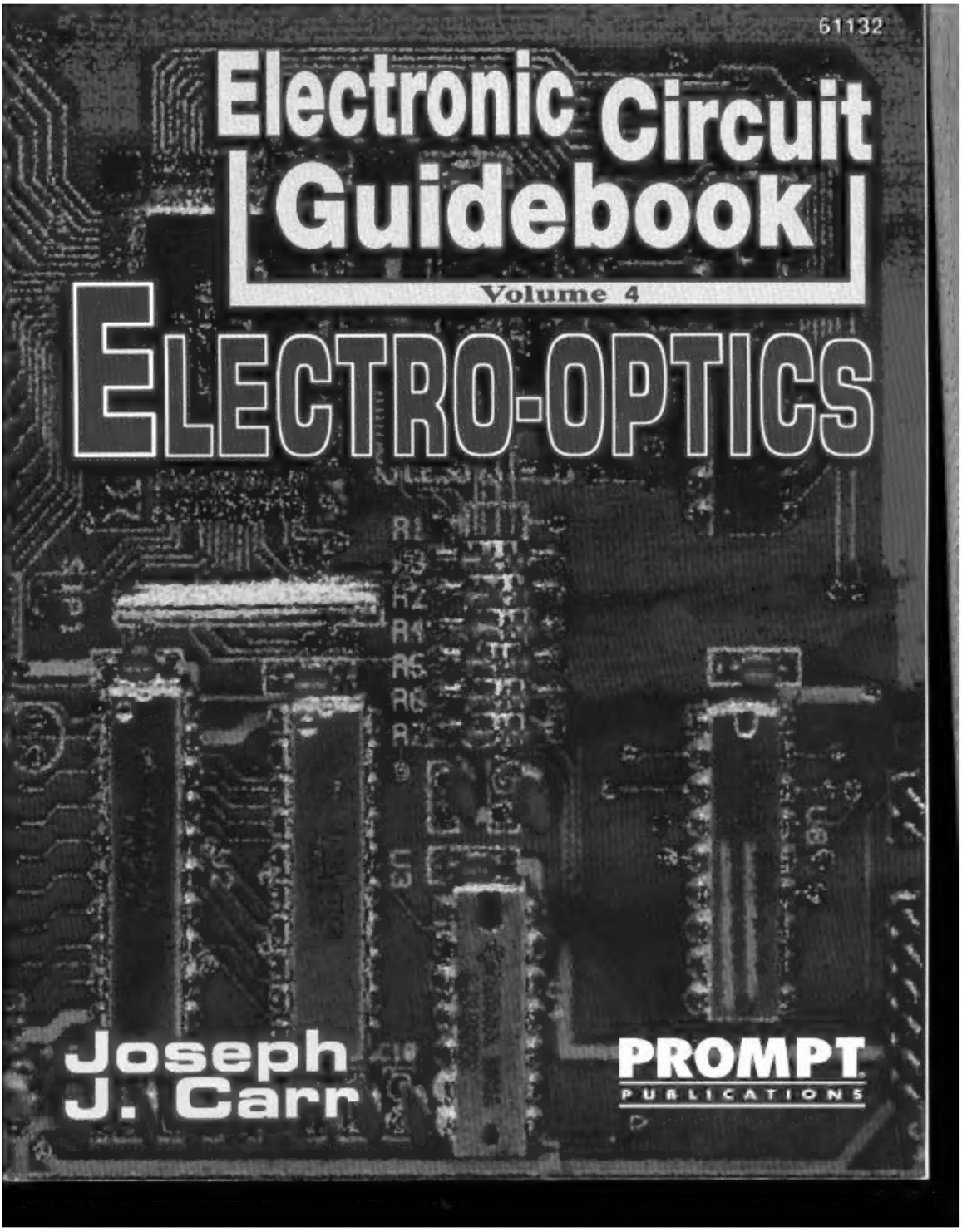

Jameco Part number 147272

Chapter 1

Introduction to Light and Electro-Optics **1**
A Brief History of Light 2
The Early Scientists 2
Early Scientific Philosophies 7
Twentieth Century Developments 9
Waves 12
Frequency and Wavelength 12
Electromagnetic Waves 14
Wave Propagation 17
The Electromagnetic Spectrum 22
Standing Waves 23
Summary 25

Chapter 2

More Light Physics **27**
Light Level Measurements 27
Electron Behavior in Electric and Magnetic Fields 30
The "Billiard Ball" Model of Electron Dynamics 31
Electron Motion in Linear Electrostatic Fields 31
Example 2-1 35
Solution 35
Example 2-2 35
Solution 36
Why Not a Perfect Vacuum? 36
Motion in an Orthogonal Electric Field 37
Example 2-3 38
Solution 38
Example 2-4 39

Solution 39
Relativistic Effects on Electrons 39
Example 2-5 40
Solution A 40
Solution B 40
Electron Motion in Magnetic Fields 41
Example 2-6 43
Solution 43
Example 2-7 44
Solution 44
Electron Motion in Simultaneous E and H Fields 44
Motion in Parallel Fields 44
Quantum Mechanical Description Of Electrons 46
Example 2-8 51
Solution 51
Summary 54
References 55

Chapter 3

Mirrors, Prisms and Lenses 57
The Keys to Electro-Optical Instruments 57
Refraction and Total Internal Reflection 58
Example 3-1 60
Solution 60
Example 3-2 62
Solution 62
Refraction/Reflection from Slabs with Parallel Faces 63
Shimmering, Mirages, and Looming 64
Mirrors 66
Ray Tracing and Sign Conventions 67
Planar Mirrors 69
Spherical and Parabolic Concave Mirrors 71
Example 3-3 75
Solution 75
Example 3-4 76
Solution 76
Spherical Aberration 77
Convex Mirrors 78
Lenses 79
Standard Rays and Labeling for Lenses 81

Example 3-5 85
Solution 85
Example 3-6 86
Solution 86
Lens Defects 87

Chapter 4

Photoemissive Sensors: Phototubes and Photomultiplier Tubes 89
Photomultiplier Tubes 94
Spectral Response of Photoemissive Sensors 98
Phototube and Photomultiplier Tube Applications 100

Chapter 5

Light Sources 105
The Sun, Fire and Flames 106
Incandescent Light Source 106
Glow Lamps 107
Solid-State Light Sources 108
PN Junction Light Radiators 112
LED Construction 117
Mounting LEDs 119
Simple LED Circuits 119
Example 5-1 121
Solution 121
Variable Brightness LED Circuits 121
Example 5-2 123
Example 5-3 124
Example 5-4 125
Driving LEDs from Digital Circuits 126
Example 5-5 127
Solution 128
Example 5-6 130
Polarity Tester 132
Voltage Comparator Output State Indicator 133
Voltage Level Indicators 134
Homemade LED Optocoupler 135
Simple Digital Logic Probe 136

Jameco Part number 147272

Chapter 6

Photoconductive Cells **139**
Spectral Response 141
Sensitivity 143
Relative Sensitivity 144
"Light History" Errors 145
Temperature Coefficient 145
Response Time 146
Photoresistor Circuits 147
Example 6-1 149
Solution 149
Light Meter Circuits 150
Light-Operated Tone Generator 151
Light-Controlled Relays 152
Light-Operated Audio Switch 154
Optical Chopper for Low-Drift Amplifiers 155
References 156

Chapter 7

Photovoltaic Cells **157**
Photovoltaic Phenomena 158
Metal-Oxide/Semiconductor Devices 158
Silicon PN Junctions 160
Infrared Photovoltaic Sensors 162
Photovoltaic Cell Characteristics 164
Photovoltaic Cell Applications Circuit 168
Instrumentation/Communications Applications 168
Example 7-1 170
Solution 170
Solar Cell Applications 172

Chapter 8

Photodiodes and Phototransistors **179**
Photodiodes 182
PIN Photodiodes 185
Avalanche Photodiodes 186
Phototransistors 187
Application Circuits 193
Selecting a Sensor 196

Jameco Part number 147272

Chapter 9

Optoisolators, Optocouplers and Optoswitches **199**
Optoisolators and Optocouplers 200
Styles of Optoisolator 204
Optoisolator/Optocoupler Circuits 206
Example 9-1 207
Solution 208
Packaging of Optocouplers and Optoisolators 211
Optocoupler Application Circuits 212
Analog Multiplier Circuit 217
Notes 221

Chapter 10

Electronics Amplifiers for Electro-Optical Circuits **223**
Properties of the "Ideal" Operational Amplifier 223
Differential Inputs 224
Circuit Analysis Using Ohm's Law and Kirchoff's Current Law 225
Example 10-1 227
Solution 228
Noninverting Followers 228
Operational Amplifier Power Sources 231
Practical Op-Amp Devices: Real-World Problems 232
DC Differential Amplifiers 235
Practical Circuit 238
Differential Amplifier Applications 241

Chapter 11

Electro-Optical Medical Instruments **243**
Photocolorimetry 243
Photoplethysmograph: The Sensor You Can Build 249
Blood Oxygen Measurement by PPG 253
Summary 253
Notes 253

Chapter 12

Integrated Circuit Electro-Optical Sensors **255**
Differential Light Measurement 262

Jameco Part number 147272

Chapter 13

X-ray Sources and Radiation Detectors **263**
The Nature of X-Rays 265
Example 13-1 267
Solution 267
Generating X-Rays 268
Geiger-Mueller Tubes 273
Photomultiplier Tubes 277
Scintillation Counters 278
PN Junction Diodes 279
Alpha Particle Detector 281

Chapter 14

Lasers **283**
Laser Classification 284
Basic Concepts 284
Types of Lasers 289
Insulating Solid-State Lasers 289
Insulating Crystal Lasers 290
Excimer Lasers 291
Gas Lasers 291
Solid-State PN Junction Lasers 294
Driver Circuit for Solid-State Laser Diodes 297
Summary 300
Notes 301

Chapter 15

Fiber Optic Technology **303**
Review of the Basics 307
Fiber Optics 310
Intermodal Dispersion 314
Graded Index Fibers 318
Losses in Fiber Optic Systems 320
Example 15-1 320
Example 15-2 321
Converting Between dB Notation and Gain Notation 322
Special dB Scales 324
Fiber Optic Communications Systems 329
Receiver Amplifier and Transmitter Driver Circuits 331
Notes 336

Jameco Part number 147272

Chapter 16

Television Sensor Tubes **337**
The Basic Television System 337
TV Camera Sensor Tubes 340

Chapter 17

More Optical Instruments **347**
Flame Detectors 347
Photodensitometers 350
Example 17-1 353
Solution 353
Telescopes 354
Example 17-2 356
Simple Photographic Camera 358
Projectors 359
Compound Microscopes 360
Spectrophotometers 361
Ratiometric Instruments 362
Example 17-3 365

Chapter 18

Optical Sensor Resolution Improvement Techniques **367**
Other Resolution Issues 373
Sensor Resolution Improvement Techniques (SRI) 375
Simulation Effort 381
Laboratory Model of the Two-Sensor Approach to SRI 381
Single-Sensor Method 382
Summary 383
References 384

Index **385**

Jameco Part number 147272

Preface

Electro-optics is the marriage of electronics and optics to form a wide variety of instruments, circuits, and devices with a large number of uses. For example, the "electric eye" used by the shopkeeper to alert her when customers arrive is an electrooptical device; the burglar alarm that alerts her when other-than-customers arrive after hours is also an electro-optical (E-O) device.

This book is about E-O *sensors*, i.e., those electronic transducers that convert light waves into a proportional voltage, current, or resistance. The coverage of the sensors will be wide enough to allow you to understand the physics behind the theory of operation of the device, and also the circuits used to make these sensors into useful devices. We will take a look at the photoelectric effect, photoconductivity, photovoltaics and PN junction photodiodes and phototransistors.

Also examined is the operation of lenses, mirrors, prisms and other optical elements. These discussions are keyed to a couple of chapters on light physics, which you will need to understand before studying E-O instruments.

Other devices including optoisolators, optical fibers, X-ray sensors, TV sensors and some additional optical instruments such as telescopes and scientific instruments are also discussed in detail. The circuits for using sensors in E-O instruments, and for interfacing them with computers, are also discussed in sufficient depth to allow you to apply them to practical situations.

The author wishes to acknowledge the assistance of editor Jim Rounds of SAMS, Steve Bigelow, and Bob Clark--who provided immense wisdom and advice.

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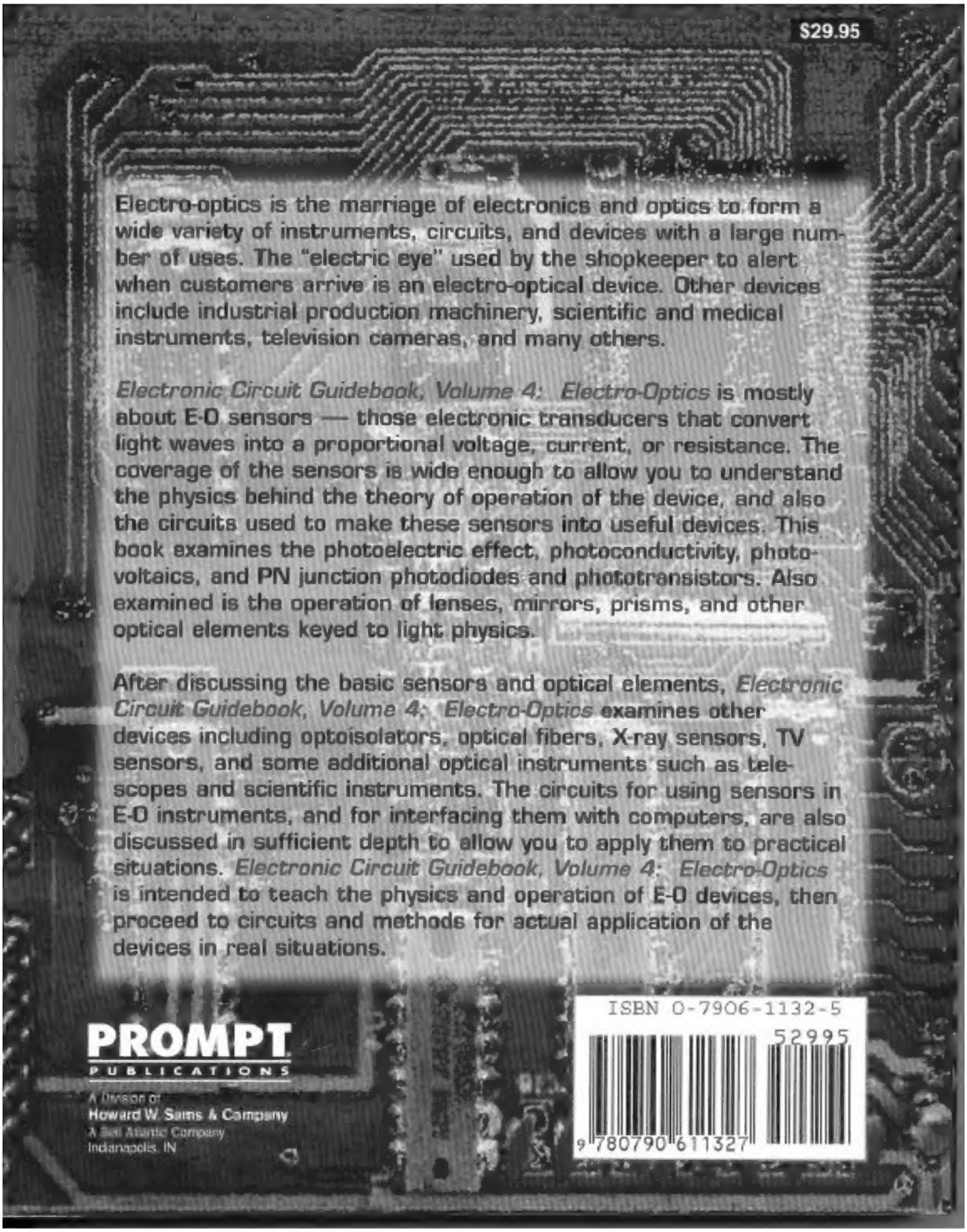
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Electro-optics is the marriage of electronics and optics to form a wide variety of instruments, circuits, and devices with a large number of uses. The "electric eye" used by the shopkeeper to alert when customers arrive is an electro-optical device. Other devices include industrial production machinery, scientific and medical instruments, television cameras, and many others.
Electronic Circuit Guidebook, Volume 4: Electro-Optics is mostly about E-O sensors — those electronic transducers that convert light waves into a proportional voltage, current, or resistance. The coverage of the sensors is wide enough to allow you to understand the physics behind the theory of operation of the device, and also the circuits used to make these sensors into useful devices. This book examines the photoelectric effect, photoconductivity, photovoltaics, and PN junction photodiodes and phototransistors. Also examined is the operation of lenses, mirrors, prisms, and other optical elements keyed to light physics.
After discussing the basic sensors and optical elements, *Electronic Circuit Guidebook, Volume 4: Electro-Optics* examines other devices including optoisolators, optical fibers, X-ray sensors, TV sensors, and some additional optical instruments such as telescopes and scientific instruments. The circuits for using sensors in E-O instruments, and for interfacing them with computers, are also discussed in sufficient depth to allow you to apply them to practical situations. *Electronic Circuit Guidebook, Volume 4: Electro-Optics* is intended to teach the physics and operation of E-O devices, then proceed to circuits and methods for actual application of the devices in real situations.
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